

Remarks

The examiner's reconsideration of the application is requested in view of the new claim set above and comments which follow.

The examiner has set forth her position fairly clearly in the responsive comments on pages 2 and 3 of the office action. Then, the examiner refers to the IDS filed in this application and the failure to consider the references. The examiner refers to filing of the IDS under 37 C.F.R. §1.97(c). That, however, is incorrect. Clearly the IDS was filed under 37 C.F.R. §1.97(b), in that the IDS was filed before the mailing of a first office action on the merits of the application. Thus, there is no requirement to explain the relevance, and the applicants appreciate that the examiner may not be able to consider any non-English reference. A proper IDS has been submitted in the first instance.

The examiner has rejected former claims 21, 33, 35 and 36 under 35 U.S.C. §112 as being indefinite because there is no support for the claimed limitation of "up to 30% silver". Reconsideration is requested.

Contrary to what the Examiner states the specification clearly recites up to 30% silver is included in the coating. See page 3, lines 22 and 23. The reference to 20-30 % silver nitrate solution states the following:

"One aspect of the present invention is the inclusion of silver metal in the final superconducting ceramic coating. This is achieved as mentioned above by inclusion of about 20% to 30% by weight of the ceramic materials of silver nitrate when nitrate solutions are spray dried and the flame sprayed or by addition of Ag₂O powder in an oxide slurry which is then spray dried and flame sprayed." (page 18, lines 26-30)

This statement occurs in the section of the specification that describes the illustrative embodiments. Thus, the silver nitrate amounts are an embodiment of the present invention but are not necessarily limiting on the invention. Page 7, lines 23 to 30 points out that what follows in the specification refers to embodiments which are not necessarily limiting details.

In addition, it states on page 3, lines 15 to 17:

"Preferably, about 20% or up to 30% of a noble metal is included in the oxide material to improve electrical and thermal properties of the deposited layer."

Thus, the preferred embodiment is "about 20%". 30% silver nitrate results in 108/170 times 30% silver into the coating, that is 19% or "about 20%". Thus the reference to 20-30% silver nitrate relates to a disclosure of how to achieve the preferred embodiment -- it is not a definition of the upper limit of the invention.

Further page 3, lines 22 and 23 refers to silver oxide (Ag_2O) being deposited. 30% silver oxide means $30 \times 216/232$ % of silver in the spraying material = 28%. However, this is in the sprayed material, i.e. before it has become the coating. It is well known in the art that thermal spraying can change the oxide contents in the sprayed material, i.e. by reduction of some of the oxides the deposited coating does not have the same proportions of ceramic oxides as the material used for spraying. In the present case silver nitrate or silver oxide are reduced to pure silver. Similar processes go on in the sprayed ceramic oxides, e.g. the more easily reduced oxides are reduced to metal. Thus, the ratio of silver to the ceramic oxides in the deposited material can and usually does change compared to the as-sprayed material -- usually by a few percent. Thus, there is nothing unusual or extraordinary in the fact that the deposited coatings as measured include up to 30% silver compared to the deposited ceramic oxides. In fact the skilled person would expect the percentage of silver metal to increase compared to the ceramic oxides compared to the amount of silver in the sprayed material as a ratio of the ceramic oxides in each case.

It is therefore respectfully suggested that the Examiner's argument is technically and legally unfounded.

The examiner has rejected former claims 18 - 26 and 33 - 36 under 35 U.S.C. §103 as being obvious over Chen U.S. Patent Number 5,196,400 in view of the article by Cukauskas. Reconsideration is requested in view of the new claims above and comments below.

Claim 48 includes the step of cooling the substrate during the deposition to a temperature of between 25 and 150°C. Basis for this can be found on page 5, line 16 of the patent application. With respect to a combination of Chen et al. and Cukauskas the applicants have the following comments:

Cukauskas relates to the deposition of micron coatings onto a single crystal MgO substrate – top of left hand column, page 6947. On the other hand claim 48 is limited to at least 5mm. Thus, one is talking about coatings which are at 500 times thicker than those disclosed in Cukauskas. The thermal conditions and mechanical stresses of depositing a layer of the order of millimetres on to a substrate are massive compared with those experienced in the deposition technique of Cukauskas. Also, the coatings of the present invention are for deposition onto metal cores for use as a target in a sputtering magnetron. This is very different than depositing on to a perfect crystalline coating of semiconductor precision such as single crystal MgO. Cukauskas relates to very fine coatings in a highly specialised semiconductor environment and is non-analogous art with respect to the deposition of macro-size coatings in accordance with the present invention.

Furthermore, absent the teaching of the present application, there is no motivation for the skilled person wanting to produce thick coatings of several mm to consider Cukauskas nor to combine the teaching with Chen.

In addition, the process of Cukauskas requires ramping up the substrate temperature, during the deposition, to a temperature range of 350 to 850°C – see right hand column, page 6946, lines 9-11 of section II. This ramp is necessary for nucleation at the lower temperature of 350°C – see right hand column, page 6946, lines 11- 13 of section II followed by higher temperatures for deposition. On the other hand, claim 50 requires cooling of the substrate. The skilled person would see the ramping step of Cukauskas as essential to the process as it determines both nucleation and film growth. Nucleation is a key process in the deposition of any film. The skilled person would understand that this is a requirement of the Cukauskas method and to alter these temperatures would require experimentation and would be an indication of inventive activity.

Chen discusses cooling the target during sputtering not during the deposition process by

flame or plasma spraying. Although cooling is known the specific temperature range specified in claim 48 is not obvious.

Hence, even a combination of Chen and Cukauskas does not lead to the claimed subject matter.

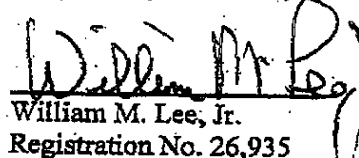
Claim 57 has been written as a product by process claim. Due to the specific nature of the process including the severe cooling represented by the features of claim 48, the morphological form of the deposited coating is new. Thus the product is new of itself.

Therefore, given the above and the revised claims for the application, it is submitted that the application distinguishes from the prior art and is allowable thereover. The examiner's further and favorable reconsideration in that regard is urged.

As this response is being sent during the sixth month following the examiner's office action, an appropriate petition for extension of time is also submitted herewith.

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